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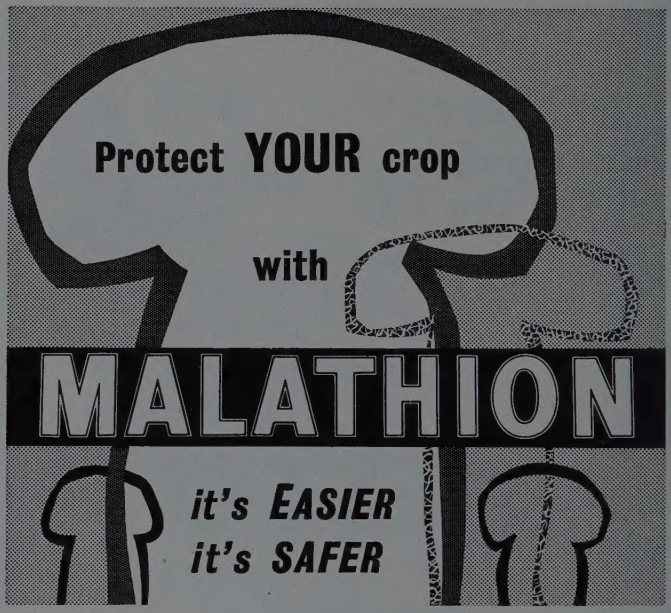

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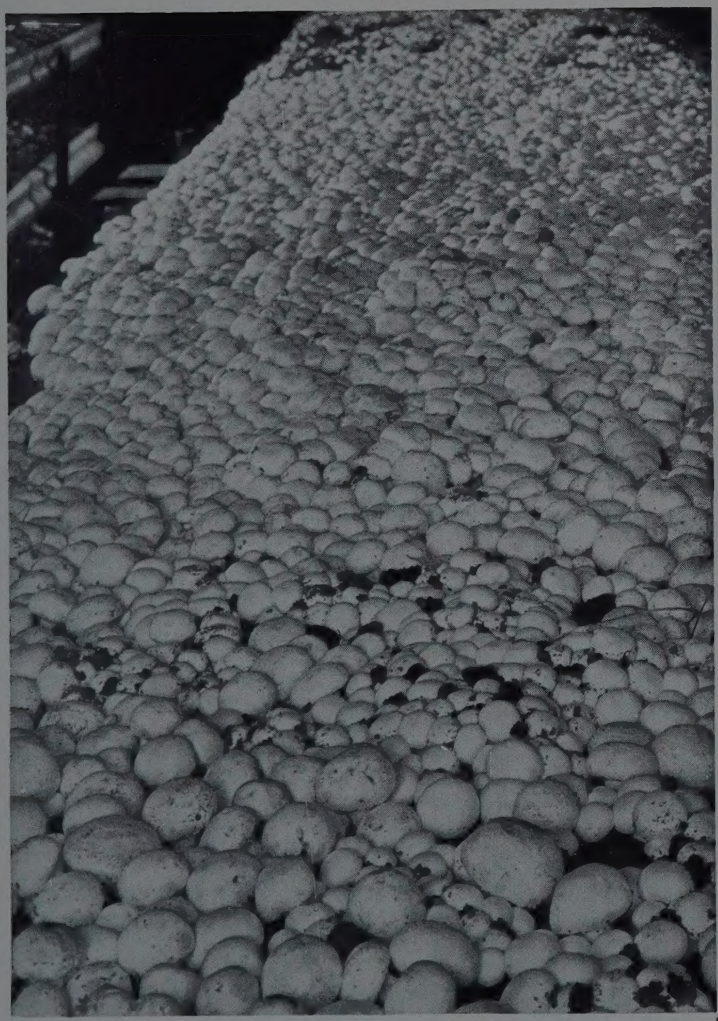

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EDITORIAL

THE WAY AHEAD

One of the most striking features of the recent two-day conference at Southport was the fact that some 200 growers thought it worth while to attend, and, from the various opinions expressed afterwards, all of them felt that the effort and expense was fully justified.

It is not an easy thing to maintain interest and enthusiasm throughout the course of some fifteen separate papers, in the space of two days, especially when practically the whole of one afternoon was devoted to a machinery demonstration. Yet this is exactly what happened and more, the attendance on the final afternoon after a surfeit of question and answer, facts and figures, was as high as for those papers delivered in the early part of the proceedings.

The readiness of mushroom growers in this organisation to read, mark and, we hope, inwardly digest, has to be experienced to be believed, and it is this desire and determination to further their knowledge of that which they have made their life business, which has established the members in a leading and envied place in the horticultural industry of the United Kingdom.

Inevitably, visitors from overseas express their admiration of this unceasing determination to know more and to grow more, and there can be little if any fear that the future of the industry is in good hands.

Whether or no the present publicity campaign can keep pace with the ever increasing production, made possible by increased knowledge and capital expenditure—for plenty of the latter is still going on—remains to be seen, but nobody will question the crying need for greater and greater effort in all fields. Extra production is inevitable, but the publicity front remains somewhat uncertain. It is by no means sure that those members who, at the moment, devote so much time and energy to publicity, will or even can continue to do so. The trials and tribulations which accompany the continual need for economy and the continual need for more and more publicity have to be experienced to be believed.

Yet, it is in increased knowledge, increased production and increased publicity that the way ahead most surely lies. It is a path all will have to tread. The wisdom of increased production from increased capital expenditure and expansion is an entirely different matter. WRA

DISEASES AND DISORDERS

By D. G. GANDY

Glasshouse Crops Research Institute

Before discussing the results of the disease section in the questionnaire, one important point should be borne in mind. The number of replies received was comparatively small, so that an analysis of the results, based upon this small number, may not give a particularly accurate estimate of present conditions in the mushroom industry.

The object of the first part of the disease section was to obtain information on the frequency and severity of mushroom diseases with a view to using it as a guide when planning future research. The estimation of disease severity is difficult for a number of reasons. Without properly controlled experiments it is almost impossible to make an accurate estimate of crop loss due to disease. A grower is more likely to regard one spectacular outbreak as having caused a more serious loss than a number of smaller ones, although the total loss may have been greater in the latter case. With a questionnaire of this type reliance must be placed on growers' judgment, which differs widely with individuals. A loss of a quarter of a pound per square foot may alarm one grower and not another; in fact, the extent of a loss cannot be estimated unless accurate records are kept. The recording of the presence of a disease is also related to the vigilance of the grower. Generally speaking, the more efficient the grower, the more observant he is; because of this, the questionnaire results may give the impression that the best growers have the most diseases.

It must also be assumed that a grower has correctly identified his diseases, which is not always the case. For this reason, La France disease, mummy disease and *Fusarium* have been grouped together in this summary since they have similar symptoms and there is much confusion over their identification.

Three estimates of disease frequency and severity were made. Growers were asked to state which diseases had been found during the past year, which had caused crop loss, and which were considered to be the most serious on the farm. Table I indicates the relative importance of the major mushroom diseases, expressed as the percentage of farms on which each disease was found. It will be noted that the frequency of diseases is not always related to the severity of the outbreaks. There is also some discrepancy between the relative importance of diseases causing crop losses and those which are thought to be most serious. Taking all three factors into consideration, the most important mushroom diseases at the present time appear to be bacterial spot or blotch, La France disease, *Dactylium*, bacterial pit and yellow moulds.

Comparison with data obtained from the previous questionnaire shows that more growers have reported the presence of diseases but fewer find that diseases are causing crop losses. This may be due to

TABLE I
Mushroom diseases: frequency and severity of outbreaks

Disease	Percentage of farms		
	Disease present	Disease causing loss	Disease most serious
Bacterial spot, blotch	80	9	18
Bacterial pit ..	56	8	8
Dactylium	50	13	16
Mycogone	49	9	16
Verticillium ..	28	—	5
White plaster mould	38	3	3
Brown plaster mould	33	4	3
Yellow moulds ..	37	6	19
Red Geotrichum ..	15	4	4
Truffle	25	4	5
La France, etc. ..	46	9	23

greater vigilance and better control methods. Then, as now, bacterial spot and blotch, *Dactylium* and yellow moulds were amongst the most important diseases.

It is interesting to note that *Dactylium* and *Mycogone* are still considered to be serious diseases, in spite of the introduction of zineb. However, not all growers with these diseases use this fungicide. Of growers with *Dactylium* 59% use it and all are satisfied with the results; a similar percentage of growers with *Mycogone* use it, but only 26% are satisfied, while 63% with *Verticillium* use it and 27% are satisfied.

The most notable change in the disease situation in recent years has occurred in respect of La France disease. It was unknown in this country at the time of the last questionnaire, when some 23% of growers reported the presence of mummy disease or *Fusarium*. After allowing for a proportion of wrong identifications, the type of disorder characterised by the death of immature mushrooms and greatly reduced crops seems to have become a major problem in recent years.

The second part of the disease section was devised to ascertain which were the most common symptoms seen by growers when they thought they had La France disease. Table II gives the percentages of growers observing the various symptoms described in the questionnaire, and Table III the percentages reporting various types of mushroom deformity. It becomes apparent from the data shown in these two tables that the majority of growers replying to the questionnaire have seen *all* the symptoms described, a fact which does not help to clarify the situation.

TABLE II

La France disease and similar disorders
Symptoms observed

Symptom	Percentage of growers observing symptoms
Death of immature mushrooms	72
Rotting after death	50
Dry rot	28
Wet rot	33
Deformity of mushrooms	78
Discolouration of mushrooms..	69
Poor development of gills	81
Poor development of veils	56
Symptoms appear in first flush	36
„ „ „ second „	53
„ „ „ third „	72
„ „ „ fourth „	44
„ „ „ fifth „ or later	36
Successive flushes affected	86
Appears in same places in successive flushes	53
Spreads during cropping	78
Cropping ceases prematurely	50

Has the spread of these disorders coincided with the introduction of any major change in mushroom growing? The most important one which has occurred since the previous questionnaire has been the introduction of peat casings and their widespread adoption, but we have no experimental evidence to indicate that the two are connected.

These disorders are more frequently seen on beds than trays; this is probably because beds are more easily inspected and there is no barrier to the spread of a disease as there is when the crop is grown in self-contained trays. The disorders are more frequent in compost made from light horse manure and in compost which has been turned three times. The duration of composting does not appear to have any effect.

Analysis of the questionnaire replies has shown that the frequency of a disease is much the same irrespective of the cultural methods used. It might be expected that such operations as peak heating, the " cooking out " of houses after cropping, and the disinfection of trays or boards would influence the distribution of diseases, but this does not appear to be the case. Table IV shows the frequency of the more important diseases when various cultural practices have been employed. It must again be noted, however, that these results have been based on a small number of replies and that with a larger number a clearer picture might emerge.

TABLE III
La France disease and similar disorders
Types of mushroom deformity

Type of deformity	% Frequency
Long stipe	92
Stipe thickened at both ends	50
Stipe thickened at base only	64
Stipe thickened at annulus	47
Stipe thickened throughout	78

TABLE IV
Some cultural practices and the incidence of disease

Growing method	Percentage of growers using each method with following diseases:				
	Bact. spot	La France	Dactylium	Bact. pit	Yellow moulds
Trays	74	34	45	50	29
Shelves	78	44	51	56	40
Peak heating	76	46	42	61	39
No peak heating	56	33	22	22	11
Peak heat with live steam	80	43	43	66	34
Peak heat with braziers	70	56	59	59	52
Spent compost used on farm	67	44	56	48	37
Spent compost removed	78	47	51	63	35
Houses heated up before emptying	81	68	64	55	41
Houses heated up after emptying	83	50	50	50	17
Houses not heated up	73	37	46	60	37
Walls, etc., disinfected after emptying	75	46	48	55	38
Walls, etc., not disinfected	88	25	63	50	13
Trays/Boards disinfected after use	88	47	35	59	29
Trays/Boards not disinfected	80	40	40	47	20
Disinfection of trays/boards by dipping	70	43	51	51	46
„ „ „ „ spraying	81	45	55	61	32
„ „ „ „ boiling	83	33	50	50	33

THE SOUTHPORT CONFERENCE

By general consent, the two-day conference at Southport, on 2nd and 3rd October, will go down in history as the most successful event ever organised by the MGA.

In the early days there was some misgiving as to the wisdom of substituting a conference for the annual exhibition and conference combined and, for sure, the social side was completely absent apart from the informal " get togethers " in the evening.

It was felt that 200 was the highest attendance that could be hoped for and, with this in mind, just 200 copies of the various papers were printed for distribution to the delegates. But they were not enough, for, in the last few days before the conference there was a rush for tickets and, in all, just over 240 tickets were distributed. True, many went to wives of delegates, but the lectures proper attracted regular audiences of around the 200 mark.

The arrangements were carried through without any undue upsets and a rather crammed programme was completed to time.

It was natural enough that interest should centre on the talks bearing on the new " Brown Disease," on which opinions appeared to differ. It was obviously too early to hope for concrete results, yet much light was let into many dark corners and good will inevitably follow.

The complete programme and list of speakers has already been published in *The Bulletin* (p. 232, Bulletin No. 91, July, 1957), and, as all the papers are to be reproduced in a forthcoming issue of this publication, it is not proposed to refer in detail to them here.

Suffice it to say that interest was fully maintained from beginning to end, that the machinery demonstration on the first afternoon attracted more exhibitors than had been anticipated and that the mushroom competitions judged by Mr. C. P. Chamberlain, of Trowbridge, Wilts., and Mrs. Evelyn Rose, a Manchester journalist, quite surprisingly attracted a record entry, thanks in no small measure to the industry of Mr. F. Bleazard, Vice-Chairman of the MGA.

In these mushroom competitions, details of which are on another page, competition was intensely keen, nowhere more so than in the "Smart Cup " where there were eleven competitors. Here, exhibited by the Broadham Produce Co. Ltd., of Oxted, were the perfect mushrooms, awarded maximum marks by the judges, and here too were the near perfect specimens for, against the 100 marks awarded to the winners, Loddington Farms Ltd., of Linton, Maidstone, gained 99 and Aylesbury Mushrooms Ltd., Aylesbury, Bucks., 98. Thus two marks only separated the first three competitors.

Heartening too were the efforts made by many competitors to ensure that their mushrooms arrived as fresh as possible. They were transported by rail, by sea, and even by air, for J. Stewart-Wood, of Aylesbury Mushrooms, flew to a nearby airport in his Auster plane, arriving at about 11 a.m. on the morning of the competitions. In some

All smiles when receiving their cups. Left to right: G. C. Smith (Loddington Farms), T. Orritt (Burscough Bridge) and Miss Shirley Baker (Broadham Produce Co. Ltd.).

cases mushroom farms staffs were working practically throughout the night and in one case the exhibits were specially escorted across London to ensure that rough handling was avoided.

Three cups, including the coveted MGA award, went to Broadham Produce Co. Ltd. (Messrs. Baker & Jones), who have been so consistently successful over the last few years and three awards also went to Loddington Farms Ltd. (Mr. G. C. Smith) of Linton, Maidstone, who last year exhibited mushrooms described as the best in the show. The Stable Manures Cup with its attractive replica went North, to Mr. T. Orritt, of Burscough Bridge.

Challenging for the first time were growers in Northern Ireland and Eire, a challenge which, it is to be hoped, will be repeated for many years to come.

J. Stewart-Wood (Aylesbury Mushrooms Ltd.) receiving one of his awards from the Mayor of Southport. MGA Chairman, G. V. Allen evidently enjoys it all. Centre background is F. Bleazard, MGA Vice-Chairman.

Herewith is part of the score card in the Smart Cup competition, showing just where the runners-up lost that all important mark or two:

Appearance	Weight	Size and Uniformity	Trimming	Colour and Shape	Maturity	Condition (defects)	Total
Broadham Produce							
15	15	15	10	10	15	20	100
Loddington Farms							
14	15	15	10	10	15	20	99
Aylesbury Mushrooms							
14	15	15	10	10	14	20	98

The judges, C. P. Chamberlain of Trowbridge and Mrs. Evelyn Rose, well-known Manchester journalist.

But to return to the more important aspects of the Southport venture—the fifteen papers. Not before, in the MGA's history, had so many papers been collected for presentation. It was unfortunate that the number of copy papers available was insufficient.

It had been arranged for these papers to be printed in forthcoming issues of the Bulletin, from time to time, but it has since **been decided to publish them, as one issue of the Bulletin, in April, 1958, when the 100th issue of the publication will be celebrated. Thus members will have all the papers as one volume.**

As was expected, a large crowd attended the cocktail party, when the Mayor of Southport presented the cups and other prizes to the competition

The Mayor of Southport receiving a box of chocolates from Mrs. G. V. Allen, wife of the MGA Chairman (seen in the centre).

Right (top): Guy Reed and his Peter with Dr. W. Arnold f East Germany, seen on the lef the picture.

Right (centre): C. R. Rasmu (left) with F. Bleazard and R. Dumbreck (Scotland) on the ri

Right (bottom): Two French visit M. Pierre Guiochon (right) M. Yves Desnous (left) exami spawn marketed by M. Guioc in a plastic container.

Robt. G. Darlington (W. Darlington & Sons Ltd., Worthing,) giving the opening lecture. On the right is Miss D. G. Gandy listening to a discussion between Dr. R. L. Edwards and Dr. N. W. Hussey.

winners. Like so many other civic personalities on whom mushroom growers descend from time to time, she was a little surprised by it all. She was presented with a box of chocolates by Mrs. Allen, wife of the MGA Chairman.

It was Mr. Allen who officially opened the conference and gave a warm welcome to all the delegates. He mentioned, in his opening address, the regret everyone felt at the absence through indisposition of Mr. Fred. C. Atkins who, with Mr. Bleazard and Mr. Stanley Middlebrook comprised the organising committee. A message of good wishes was sent to Mr. Atkins. Another notable absentee at the last moment was Mr. J. A. Linfield and both he and Mr. Atkins were wished a speedy recovery.

Mr. Atkins was to have been Chairman of one of the sessions and his place was taken, at short notice, by Mr. Baker.

The visit of Dr. Arnold from East Germany, added interest to the conference and, in a delightful speech he presented the MGA with a picture album showing the progress being made with mushroom research in his part of Germany. He mentioned that all members would be welcomed if they visited Germany. His government, he said, had allocated about £15,000 for mushroom research. Dr. Arnold spoke in German and Mr. H. G. Schaffer, the well-known horticultural journalist, acted as interpreter.

At the conclusion of the conference, Mr. Allen made reference to the hard work put in by Mrs. Bleazard and other ladies in connection with the conference and the mushroom competitions and he presented Mrs. Bleazard with a box of chocolates. He also cordially thanked all the speakers and congratulated them. The delegates too were thanked for their attendance. To Mr. Atkins, who arranged for all the papers, and translations where necessary, went special thanks.

Dr. N. W. Hussey of the Glasshouse Crops Research Institute and Dr. R. L. Edwards, former MRA Director of Research.

The opening session of the Conference.

C. P. Chamberlain, Robt. Patterson (N. Ireland), G. M. McArthur (who now farms in Devon) and the MGA Secretary.

Some of the younger generation of growers. Peter and Paul Middlebrook (Yorks.) talk with Shirley Baker.

IT CAN BE DONE

Among the lecturers at the Southport Conference was Mr. S. A. F. Sampson, of Oving, Chichester, Sussex. Introducing him the Chairman, Mr. Stanley Middlebrook, said, "He is probably producing more mushrooms per sq. ft. than anyone else in this country." Mr. Sampson's production?—well, more than 12 lb. per sq. ft. per year. He short composts and grows on the tray system.

MUSHROOM COMPETITIONS

Class I **The MGA Cup.**
1. Messrs. Broadham Produce Co. Ltd., Station Road, Oxted, Surrey.
2. Messrs. Aylesbury Mushrooms Ltd., Ford, Nr. Aylesbury, Bucks.
3. D. R. Beardsell, 6 Cable Street, Formby, Liverpool, Lancs.

Class II **The Mount Cup.**
1. Messrs. Loddington Farms Ltd., Linton, Maidstone, Kent.
2. Messrs. Monlough Food Production Co. Ltd., Ballygowan, Belfast.
3. Messrs. Broadham Produce Co. Ltd.

Class III **The Broome & Green Cup.**
1. Messrs. Loddington Farms Ltd.
2. Messrs. Aylesbury Mushrooms Ltd.
3. Messrs. Broadham Produce Co. Ltd.

Class IV **The Smart Cup.**
1. Messrs. Broadham Produce Co. Ltd.
2. Messrs. Loddington Farms Ltd.
3. Messrs. Aylesbury Mushrooms Ltd.

Class V **The Thwaites Cup.**
1. Messrs. Broadham Produce Co. Ltd.
2. Messrs. Loddington Farms Ltd.
3. Messrs. Aylesbury Mushrooms Ltd.

Class VI **The Stable Manures Cup**
1. T. Orritt, 48 Orrell Lane, Burscough Bridge, Ormskirk, Lancs.
2. G. D. Griffin, Valley Mushroom Farm, Tatsfield, Surrey.
3. K. C. Bradley, Lodge Lane Nurseries, Lytham, Lancs.

Class VII **The T. J. Poupart Cup.**
1. Messrs. Loddington Farms Ltd.
2. Messrs. Broadham Produce Co. Ltd.
3. Messrs. Monlough Food Production Co. Ltd.

WORLD'S PRESS DIGEST

Mushrooms were, once again, over-supplied (*Nurseryman, Seedsman*, September 5/57). Mushroom trade remains steady with somewhat lighter arrivals (*Fruit Trades' Journal*, September 7/57). Mushrooms sold freely and, although supplies were heavy, there were few left (*Nurseryman, Seedsman*, September 12/57). Mushrooms—with a slight decrease in supplies due to disease in several nurseries—were still plentiful enough to meet the demand (*Grower*, September 14/57). Mushroom trade has improved over the last seven days, probably due to the colder weather (*Fruit Trades' Journal*, September 21/57). Mushrooms are one of the few vegetables up in price. Whether this is in part due to the recently reported new mushroom disease or whether (as some believe) the moon is in the wrong quarter to produce large flushes, is hard to say (*Grower*, September 21/57). Heavier quantities are meeting the fair demand (*Nurseryman, Seedsman*, September 26/57).

One salesman at Covent Garden reckons that every seven or ten days before a full moon brings on heavy flushes of mushrooms with a consequent temporary overloading of the market.

Grower, September 7/57.

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An outstanding feature of our cropping has been the really excellent quality of mushroom produced. We are delighted with the results and you may use this tribute as you wish.

Yours faithfully,
(signed) A. Sanford.

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Fruit Trades' Journal, September 14/57.

The buying public is already showing signs of sales resistance where higher prices are involved for pre-packs.

F. E. M. Praill in *Commercial Grower*, September 13/57.

Even with the best of produce, the transition from farm to consumer can at times bring about unbelievable changes. The handling and storage of some stuff is simply terrible.

F. E. M. Praill in *Commercial Grower*, September 13/57.

Owing to the poor prices obtained for heated lettuce last season it seems that quite a lot more growers in Cheshire will go in for mushrooms as a catch crop, but this will depend a great deal on local horse manure supplies. *Grower*, September 28/57.

In the Lea Valley the autumn mushroom is proving a most useful means of supplementing the season's cropping.

Frank Allerton in *Nurseryman, Seedsman*, September 26/57.

Mushroom imports from Eire in the first half of this year were lower—216 tons against 248 in the first half of 1956.

Grower, September 28/57.

Genite EM923, a new miticide, is claimed in the USA to kill nothing but mites and their eggs. It is applied before fruit forms. The makers are General Chemical Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York. *Grower*, September 28/57.

Factories throughout Britain which provide " Music While You Work " programmes for their workers will have to pay more for the facility in future. The Performing Right Society announced yesterday that it is imposing a 60 per cent. surcharge on its licensing rates.

Daily Telegraph, September 25/57.

In studies of the chemistry and microbiology of soil it is often desirable to work with a soil which is sterile, but use of heat or chemicals for sterilization unfortunately tends to change the chemical and nutritional properties of soil rather markedly . . . . . Small samples of soil may be easily sterilized by an electron beam of sufficient intensity and energy. As equipment becomes available larger quantities can also be handled. Use of the method would probably only be practical for laboratory and greenhouse work, or where top soil could be treated *in situ*.

A. D. McLaren, L. Reshetko and W. Huber in *Soil Science*, June/57.

An unloader, manufactured by Schröder, of Munich, consists of a flexible steel netting placed on the floor of a trailer and fastened to a roller at the rear end of the trailer. The roller is driven by a small electric motor. It is claimed that 4,500 kg. of chopped green forage are unloaded in 12 minutes.

Agricultural & Horticultural Engineering Abstracts, 8, 2, 1957.

In the Martex Manure Crusher, manufactured by Schmid and Sporri, Maschinenbau A.G., Wettingen/AG, Switzerland, the manure is hand-loaded into a funnel-shaped hopper and hydraulically carried

to a chopping unit consisting of discs and fingers, rotating at 300 r.p.m., powered by a 10 h.p. electric motor.

Agricultural & Horticultural Engineering Abstracts, 8, 1, 1957.

Sam Vesty gave this advice to his sons, who were destined to become Britain's biggest-ever suppliers of meats: Find a need, find a source of supply, and bring the two together. *The Director*, July/57.

Germany now permits imports of dried mushrooms from Britain under licence. *Grower*, August 31/57.

A number of nurseries have put down mushrooms as catch crops. One crop only is grown and the tray system is used most often. *Grower*, August 31/57.

Griseofulvin, the first antibiotic to be released by the Government for use in horticulture, has just come on to the market. Lettuce growers will be the first to benefit; it has proved highly effective in the control of botrytis of glasshouse lettuce. *Commercial Grower*, September 6/57.

Rapid and reproducible responses to many volatile flavouring constituents of vegetables were obtained with an electrochemical apparatus described by J. D. Hartman and W. E. Tolle in *Food Technology* 11, 1957.

Journal of the Science of Food & Agriculture, August/57.

The pressure on the British Government to modify its attitude to the inclusion of agricultural products is increasing from all sides on the Continent. G. R. Lampton in *Business*, September/57.

During the BBC Farm Fare programme on Wednesday, Mr. Eric Gardener was asked what he thought of the threats to British growers from European Free Trade plans. He displayed complete faith in political promises by replying that he felt the question was an academic one for at least five years. *Commercial Grower*, September 6/57.

A total nitrogen level of about 1·5% on a dry weight basis of the compost is very satisfactory for rapid composting . . . . . Over-supplementing leads to excess ammonification with the necessity of prolonged pasteurization, and often to crop failure.

Dr. Leon R. Kneebone in (U.S.) *Market Growers' Journal*, June/55.

The cause of Open Veil is unknown, but certain strains of spawn may be more susceptible than others to this abnormality.

Dr. Leon R. Kneebone in (U.S.) *Market Growers' Journal*, July/55.

Mushrooms of best quality are produced in an environment of fresh air at a temperature of 55—60° F. and relative humidity of 80—90%. There must be a gentle circulation of fresh air . . . . . A total ratio of about 10 cu. ft. of air per hour per sq. ft. of growing space is ample. For instance, the static ratio may be 4 : 1 with the air exchanged gently 2 or 3 times per hour.

Dr. Leon R. Kneebone in (U.S.) *Market Growers' Journal*, April/55.

The French Cappelle variety of winter wheat was tested at different places and compared with other common wheat varieties. Grain yields were everywhere superior to the control varieties, while straw yields were inferior, according to J. Zweifel and C. Keller in *Rev. Romande Agric., Viticult et Arboricult.* *Biological Abstracts* (D) 31, 8, August/57.

" Fungus-growing ants and their fungi " are described by Neal A. Weber in *Ecology* 37 (1), 1956. Production and maintenance of pure cultures of ant fungi may depend, in part at least, on antibiotic and growth-promoting factors in ant faeces and saliva.

Biological Abstracts (D), 31, 8, August/57.

Both for the plant breeder and for the research worker the control of plant environment is important, permitting as it does the study of effects of environment on plant growth and development and also the growth, development and control of pests and diseases. These factors which comprise the environment of the aerial parts of the plant are discussed in this article.

L. G. Morris in *Journal of Agricultural Engineering Research*, 1, 2, 1956.

The apparent advantage of p.v.c. tubing for nutritional irrigation is offset by the action of many of these compounds in promoting bacterial growths. The means by which a mucus-infested irrigation system was cleansed are described.

R. B. Sharp in *Journal of Agricultural Engineering Research*, 1, 1, 1956.

In a sense, all the major problems of mapping out the overall shape of the mushroom and the laying down of the majority of the cells is done at a very early stage, and the subsequent three to four-fold increase in size is merely the expansion of specific parts of this preformed bud, which involves the sucking up of nutrient materials from the soil mycelium.

J. T. Bonner, K. Kent Kane & R. H. Levey: Studies of the Mechanics of Growth in the Common Mushroom, *Agaricus compestris*, in *Mycologia*, January-February/56.

T. Uruyama reports in the *Botanical Magazine of Tokyo*, 69, 1956, investigations at Kyoto University, Japan, demonstrating that in sporocarps of *Agaricus campestris* one or more growth hormones produced by the gills determine the linear growth of the stipe in the active region between ring and pileus, and also the growth of the pileus itself. *Review of Applied Mycology*, August/57.

A new interest in farm building design among architects, builders and industrial designers is needed, Sir James Turner, NFU president, told the British Association in Dublin. That is why the NFU has recently established a research fellowship in the design of farm buildings, which is to be administered by the Nuffield Foundation.

Nature, September 7/57.

Judged by the severe standards of the Wye College Economics Department, the glasshouse industry in the Lea Valley is certainly hard-pressed. Whereas 88 per cent. of nurseries were currently paying their proprietor a living wage, on only 55 per cent. was the annual surplus sufficient to provide for interest as well as replacement.

Fruit Trades' Journal, September 7/57.

It seems absolutely fantastic to me that the Market Produce Show Society should have to go " cap in hand " to growers for support. After all, its funds are provided on a purely voluntary basis by about 500 growers who subscribe a guinea each year, a pretty poor number when

one considers that an industry of £130 million is involved.
Bill Sandford in *Fruit Trades' Journal*, September 7/57.

Pennsylvania mushroom growers were warned that penalties will be inflicted where manure waters are allowed to escape into streams.
AMI News, August/57.

A further evaluation of the effectiveness of vacuum cooling of fresh market mushrooms is to be conducted by University of Delaware personnel, sponsored by the American Mushroom Institute.
AMI News, August/57.

The Raytheon Manufacturing Company announced the development of a process through which vegetables, meats, fish and fruits may be dehydrated by micro wave energy in a below-freezing vacuum. Foods thus treated lose up to 80% of their weight but retain their original volume. The food can be restored to its original freshness in a matter of minutes simply by immersing it in warm water. *AMI News*, August/57.

Beds which have been for some time in bearing should be slightly sprinkled with liquid manure, applied in a tepid state, and brewed from the dung of the cow, sheep, horse or deer, without the addition of either soot or lime. James Barnes in *The Cottage Gardener*, Vol. 2, 1849.

The mushroom is pulled as a whole and not trimmed. Mr. Harâld Stridsberg says that this method keeps the mushrooms fresh for two or three days longer. It is universal in both Sweden and Denmark, and the housewife has been trained to cut off the root before cooking just as with any other fresh vegetable.
H. G. Schaffer in 1½ page article on the Stridsberg Farm in Sweden in *Grower*, September 7/57.

One pint of Bergermaster Magicote paint, say Lewis Berger (Great Britain) Ltd., Morning Lane, Homerton, E.9, will cover 100 sq. ft., and no undercoat is required. Laboratory tests, it is further claimed, show that it will stand up to severe scrubbing.
Nurseryman, Seedsman, September 12/57.

To encourage basic research in subjects affecting the food manufacturing industry, a Junior Fellowship at Sheffield University is to be sponsored by a Sheffield food firm. Colonel Maurice W. Batchelor, Chairman of the firm, said his Company would, in the first instance, provide £500 a year for three years. The award will provide for post-graduate research in the Department of Microbiology or Biochemistry, and the Fellow may work for the degree of Doctor of Philosophy.
Packaged Food Selling, September/57.

Production of white, black and other truffles in natural and planted woodlands in various districts in Italy is described and illustrated by V. Peglion in *Italian Agriculture*, 97, 1957. An experimental black truffle wood near Spoleto has become productive in its sixth year. Other symbionts beside oaks are poplars, willows and occasionally limes.
Horicultural Abstracts, September/57.

In spite of high costs of investment, according to P. A. Spoelstra, Institute of Tuinbouw Techniek, Wageningen, Holland, it is considered

an advantage to have one central boiler house on a nursery rather than separate boilers for each glasshouse. Automatic stoking, long-distance flow and return pipes, and small-diameter heating pipes can all reduce fuel costs. *Horticultural Abstracts*, September/57.

The one thing wrong at the MGA display at the Tea Centre, and I've seen it done elsewhere, was the sale of prepacks of mushrooms to the public at 1s. a quarter-pound punnet . . . . . May I suggest that creating good feeling towards the growers by creating bad feeling towards the retailers isn't good public relations?

Alec Blacke in *Fruit Trades' Journal*, September 21/57.

A new material for cold waterproofing has been introduced by British Bitumen Emulsions Ltd., Dundee Road, Slough Trading Estate, Bucks. It is claimed it is easy to apply to damp surfaces and can also be used as an anti-corrosive covering. *Grower*, September, 21/57.

Major A. L. A. Dredge, in Kent, says he has been told he cannot have a Ministry grant for a new packing shed " because there are so many demands from dairy and mixed farms which are to be given priority." This is a scandal. We intend to see that the Minister of Agriculture is pestered on the matter until it is put right—not only for Major Dredge but for every other grower.

Editorial in *Grower*, September 21/57.

A new market for millions of pounds of mushrooms was created with the announcement that the United States Army & Air Force will add mushrooms to their menu in January. *AMI News*, August/57.

In current experiments at the Danish Mushroom Research Station, the fruit was all stalk and no head where the air change was small. As the amount of air given increased, the stalk became thinner and the head bigger. Normal mushrooms appeared at 20 air changes an hour. A " change " means re-circulation of air, the air in the house being *renewed* two or three times an hour.

H. G. Schaffer in a page article in *Grower*, September 28/57.

New mushroom project, not actually growing, ensures amateurs' success. Large profits, small unit. Prepared sell idea low price. Prospects vast and constant.

Advertisement in *Commercial Grower*, September 27/57.

References:

Agriculture, H.M.S.O., York House, Kingsway, London, W.C.2.
Agricultural & Horticultural Engineering Abstracts, National Institute of Agricultural Engineering, Wrest Park, Silsoe, Beds.
AMI News, 20 West State Street, Avondale, Pennsylvania, U.S.A.
B. & G. Review, 27 St. James Street, Covent Garden Market, London, W.C.2.
Biological Abstracts, University of Pennsylvania, Philadelphia 4, Pa., USA.
Business, 109/119 Waterloo Road, London, S.E.1.
Chemistry & Industry, Society of Chemical Industry, 14 Belgrave Square, London, S.W.1.
Commercial Grower, 154 Fleet Street, London, E.C.4.
Digest of Equipment, 3 Cranston Drive, East Didsbury, Manchester 20.
Food Investigation, H.M.S.O., York House, Kingsway, London, W.C.2.
Fruit Trades' Journal, 6/7 Gough Square, Fleet Street, London, E.C.
Grower, 49 Doughty Street, London, W.C.1.
Horticultural Abstracts, Commonwealth Agricultural Bureaux, Farnham Royal.

British —by Gad, Sir!

If we wished to be fashionable, we would claim that our mushroom spawn was produced from Patagonian strains, that our Spawn Research Laboratories were staffed by Tibetans, and that the scientific equipment we use was imported (at enormous cost!) from Ruritania!

We are not ashamed to say, however, that, like the Rolls Royce and the Vickers Viscount, 100% Spawn is also 100% British. Our Spawn Research and Development Laboratories are probably the most advanced in the world, and the spawn they produce is equal, if not superior, to any spawn.

A bold statement? You can put it to the test! Next time you are spawning, run 100% Spawn against *any* other brand. You will find this all-British product outstanding for yield, quality *and* reliability.

FOR ALL METHODS OF GROWING

DARLINGTON'S 100%

PRODUCTIVE, PURE CULTURE MUSHROOM SPAWN

Memo. from Monro, Geo. Monro Ltd, Waltham Cross, Herts.
Mycologia, New York Botanical Garden, Prince Street, Lancaster, Pennsylvania.
Mushroom News, W. Darlington & Sons Ltd., Southcourt Road, Worthing, Sussex.
Nature, Macmillan & Co. Ltd., St. Martin's Street, London, W.C.2.
Nurseryman, Seedsman & Glasshouse Grower, 62 Doughty Street, London, W.C.1.
Packaged Food Selling, 110 Fleet Street, London, E.C.4.
Phytopathology, Monumental Printing Co., Baltimore, Maryland, USA.
Produce Packaging, Agriculture House, Knightsbridge, London, S.W.1.
Safety Equipment & Industrial Clothing, 9 Gough Square, Fleet Street, London, E.C.4.
Soil Science, The Williams & Williams Co., Baltimore 2, Maryland, USA.
Transactions of the British Mycological Society, Cambridge University Press, Bentley House, London, N.W.1.

If the journals referred to are generally available, they are most easily obtained by placing an order with your bookseller or stationer.

In last month's issue Robt. Patterson suggested that, from the marriage of shelves and trays might come "The Trelf" system but

NO MARRIAGE HAS BEEN ARRANGED

says M. C. Luxmoore (Snowcap Mushrooms, Yaxley—on shelves)

Robert Patterson in his article 'Shelf Tray Controversy' suggests that there may be a marrying of the two systems and the child will be **"Trelf."**

To arrange this union to the satisfaction of the two parents he advances a good many reasons for "Miss Tray's" hasty wedding not the least being that it appears she already has one or two little bastards about, but in comparison "Master Shelf" seems to have behaved in an exemplary fashion. One wonders what the parents think. As a parent of young Shelf I would say "Not much."

Patterson lambasts the "Tray" girl and then with much ingenuity seeks some fault with my son to even matters up. Listen to this:

> "Shelf Growers too are attempting to incorporate production methods which were previously regarded as Tray Growers prerogative," and "Shelf Growers have, however, adopted many predominantly Tray features where these are practical and beneficial."

(a) *Ten years ago we were cropping* $2\frac{1}{2}$ *times a year, now* 4 *times.*
(b) *We use higher temperatures during spawn run.*
(c) *We use the right spawn.*
(d) *We have higher cropping temperatures.*
(e) *Shorter cropping period.*

Please note to start with that (a) and (d) are interdependent and to make a case blacker for the boy, Patterson has sub-divided. Now he has five points instead of four.

Admitted then that we take more crops and shorter crops but what in the name of fortune has this got to do with "Miss Tray?" The girl is constantly slimming—I believe her measurements are round the 4 inch mark—and she runs down quicker, so Patterson claims that she leads the way to more crops a year and "Shelf" runs after her. Twenty years ago "Shelf" was doing $1\frac{1}{2}$ crops a year, ten years ago $2\frac{1}{2}$,

leading Mushroom Growers All agree that—

SOBEXAS MUSHROOM SPAWN

SHIRLEY ACTIVATOR 'M'

GYPSUM

SORBEX PEAT for casing

—form the basis of successful crops

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ten years later 4 crops a year, and for reasons of economy this suits. But please note that " Shelf " still retains his 8 inch girth. We've cut short the crop to prevent disease in the later stages and by virtue of new and more efficient fungicides are able to make a quicker ' Turn Round.'

Sometimes I wonder if that " Tray " girl ever does take a bath!

So to the second point of higher temperatures during spawn run. This accusation is easily dealt with because it quite simply is not true. We run spawn with regard to safety from too much heat and safety from disease (Truffle in particular). If " Miss Tray " had a lower temperature she might be less inclined to other excesses. Eighty degrees F. is a maximum and inclined to be too high but the peak has nothing to do with " Miss Tray." We are governed entirely by the advice of our Spawn Maker and our own anxiety to avoid Truffle.

Thirdly—the right spawn. " Miss Tray " must then have found it. Which? And does she know that " Shelf " has tried them all as soon as they make an appearance?

Last—Higher Cropping Temperatures. " Shelf " tries throughout the year to crop at about 60° F. Often in Summer this is most difficult and in consequence Summer is our most anxious time. We never court disaster by willingly going above it (60° F.). Quite frankly no marriage is arranged—and this is as it should be. The two systems are different and should be kept so.

The outstanding advantage of the tray system is that peak heating can take place in specially designed and highly insulated buildings. Cropping can take place in growing space ranging from beautifully constructed wooden trays in perfectly designed houses on the one side to flower pots in cellars on the other. The tray system makes peak heating unnecessary in the growing space itself. This opened the way to salvation to would-be Growers after the war. Building was virtually at a standstill, licences had to be obtained and few were granted by the Authority for Mushroom Houses, timber for shelving was also under licence. Both were expensive. However, the ingenuity of the grower remained abundant, and the market price of mushrooms a tonic. A good 'sweat box' was managed somehow. Stables, tunnels, farm buildings and the like became suitable cropping spaces. Later insulation and ventilation had to be arranged.

Would Patterson have us thank tray growers for electric fans? I bought fourteen in 1937!

The advantage of the tray system is the ease with which untutored growing space can be made available. This is a huge saving in capital outlay for the beginner. Two-tiered American houses were also a great saving in capital cost. I believe they are out of favour.

Build deep trays, stagger them in the heat room, space them well in the growing room, insulate the growing room, ventilate the growing room.

You won't excite the envy of " Mr. Shelf " nor will you have saved a halfpenny.

GERMAN GROWERS CONFER

A conference of the Bund Deutscher Champignonzüchter (German Mushroom Growers' Federation) took place in Cologne, on 30th September and 1st October, in connection with a Horticultural Conference.

There was an attendance of about 140 members and also present were representatives of Holland, Switzerland, Austria and East Germany.

Mr. E. Hullen of Erlanger, Chairman of the Federation, and who is well-known to a number of English growers, was elected Chairman for a further three years. Appointed to the Executive Committee were Mr. Witt (who holds a Diploma in Agriculture), Mr. Willeke, Mr. Dietrich and Mr. Gerber (Switzerland).

Attention was particularly directed during the conference to the cooling of above-ground cropping houses. Another problem which came in for much attention was standardisation and Mr. Mangelsdorf showed pictures of a large manure turner which he has developed.

The question of apprentices to the industry was also dealt with. A report on the work now being carried out on mushroom growing problems at the Max Planck Institute was given by Dr. V. Sengbusch and Mr. Huhnke.

Prof. Riethus, of the Technical University of Berlin, gave a paper on aeration problems.

Among those who followed the discussions and lectures with keen interest was Mr. Klinkmann, of the Ministry of Food, Agriculture and Forests, representing the West German government.

25 YEAR OLD GERMAN MUSHROOM FARM

Among the longer established mushroom farms in Germany is that of Messrs. Epi Ltd., of Hannover-Linden owned by Mr. Hunte. This farm was 25 years old on 2nd November of this year.

From a modest beginning this farm has developed into one of considerable importance and to-day functions on the modern tray system.

Mr. Hunte, pictured herewith, is also engaged on the conserving of wood grown fungi and he has a factory at Lüneburger Heide in which district many wild fungi are to be found.

From France . . .

Monsieur Bernard Zinetti has succeeded Monsieur Paul Gillard as President of the French Federation; our congratulations to both these very hard-working gentlemen, whom many of us met during the Third International Conference. The Federation's autumn meeting was held in Paris on 12th October, following a reunion at the vastly improved Experiment Centre at Montesson.

And from America . . .

We extend fraternal congratulations to our young monthly contemporary, *Mushroom News*, first published in September by the lively American Mushroom Institute—not on the lack of originality in the title, which has been used since before the War by Messrs. W. Darlington & Sons Ltd., of Worthing, England, but on the clean styling, attractive photographs, and the changeover from newsprint to art paper which was introduced with the June issue of its predecessor, *AMI News*.

Book Review . . . . . .

MUSHROOM SCIENCE 3

By **R. L. Edwards**

The publication of Mushroom Science 3, reporting the proceedings of the Third International Conference on Mushroom Science must interest all readers of the Bulletin. The object of this review is to indicate its main features, its merits and faults.

The price, more than double that of Mushroom Science 2, is high, but it is nearly twice as big, and printing in France is costly. It is divided into nine sections under general subject headings.

The papers may be classified as: twelve on mushroom growing in various countries, one review on food value of the mushroom, seven on pests and diseases, five on growth behaviour, stimulation and inhibition, one on spawn, five on compost, one on mechanisation, four on research programmes, three on other fungi, and five miscellaneous.

About twelve of the papers deal with various aspects of mushroom growing in a way which I think would make them of direct interest to commercial growers. That is not to say that the remaining papers would not interest MGA members, but their interest is general, rather than direct and practical. There are fifteen papers describing original experimental work, and six reviews of previous work, some of them very good.

Turning to individual papers, there is an intriguing one by **F. C. Atkins** in which, after comparing on graphs various climatic data with monthly yield figures at Yaxley, he concocts (if he will forgive the expression) a combined weather graph which in two years agreed closely with the curve of production month by month through the year. In 1955, however, the mushrooms thumbed their noses at the weather, particularly in the first and last three months. This is not the place to discuss the possible interpretation of these observations, which Mr. Atkins has been studying for a long time, but they clearly point to the possibility that by controlling air conditions, some of the depressions

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MUSHROOM SCIENCE 3

(Proceedings of the 3rd International Conference on the Scientific aspects of mushroom growing)

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AGRICULTURE HOUSE - KNIGHTSBRIDGE - LONDON, S.W. 1

Price 30/-

in the monthly production curve may be prevented. Perhaps in 1959, someone will point the way to achieving this in practice.

P. B. Flegg and **Miss Gandy** have described what a " normal mushroom " looks like, and have listed some abnormalities. The deviations from normal which do not seem to have occurred are more surprising than those which do; many of us must be particularly surprised to find that our " thin stalks " are probably an optical illusion. Though I do wonder which is the cart and which the horse: should the cap or the stalk be taken as the unit in deciding what is the form of abnormality. However this may be, these observations are an important step toward diagnosis of disorders causing malformation of the mushroom.

I have frequently wondered whether quarternary ammonium salts, which are widely used in industry, might be useful to us, and it is interesting to learn from **J. Roca Dumora** that they are being tried. Perhaps some enterprising British firm will now take up this new line and find out which of the products commercially available here are most suitable for our purposes.

C. R. Rasmussen's studies of composting are already well-known to us. His test for the end of useful peak-heating is interesting and presumably depends on the flocculation of dark coloured colloidal material. Some of the yields reported are so attractive that many growers have been and will be tempted, quite rightly, to try to reproduce them. I only hope that they will temper their ambition with discretion and limit the proportion of houses used in such trials. In this connection it is disturbing to see the effect of casing soil in a comparison between yields at the College and on a commercial farm. With one soil there was little difference, with another the College yields were very much higher, which I think shows how important the individual grower's touch is.

Yellow moulds are a little out of fashion at the moment, but **C. Allard's** contribution on Confetti, Vert-de-gris, and *Myceliophthora lutea* should help toward the unravelling of this complicated subject.

Imre Heltay contributes an interesting account of practical development of mushroom growing to fit particular conditions.

There are many other papers which could be mentioned but these seem to me the most interesting to MGA members.

There are two criticisms which must be recorded.

1. Some of the English papers are not in very good English and could have been improved and in some cases clarified by a capable English assistant editor. Most of the English summaries of papers given in French or German are badly written and some are consequently difficult to understand.
2. Proof reading is bad in the English papers and is not perfect in the French and German ones; in some cases this also may cause confusion.

In future publications of this series all translations should be made by someone fully proficient in both languages concerned, and all proofs should be passed by an English, French, or German editor respectively.

It would be unfair to suggest that these weaknesses seriously reduce the value of the book, but they did diminish the reviewer's pleasure in reading it. In spite of that, every commercial grower and student of mushrooms should find his money's worth in it.

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EXTREMELY MOBILE

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The small machine with the BIG turnover

Bruises and aerates–does not shred. CAN BE USED FOR ALL TURNINGS. 3 men handle 25/50 tons per day. Waters as it turns. Stacks up to 5 feet. By using the CULVERWELL MANURE TURNER throughout the whole composting process, the work is reduced to the minimum, time taken is shorter with improved results.

Will pass through a door 2′ 10″ × 5′ 10″ with the detachable wheels removed

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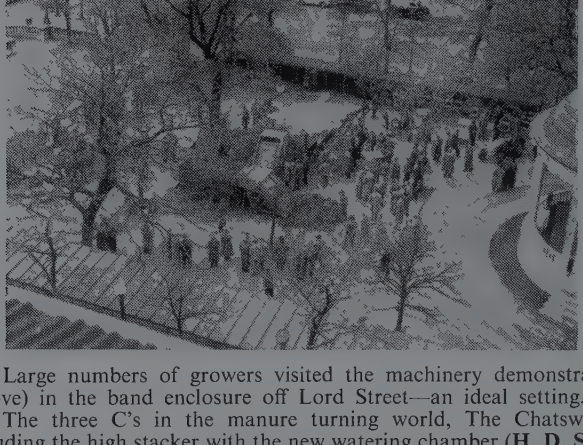

Large numbers of growers visited the machinery demonstration (above) in the band enclosure off Lord Street—an ideal setting.

The three C's in the manure turning world, The Chatsworth, including the high stacker with the new watering chamber (**H. D. Steele & Son Ltd., Worthing**), The Comporoto (**J. E. R. Simons Ltd., Harlow**) and The Culverwell (**E. O. Culverwell Ltd., Lewes**) held their usual firm interest and the opportunity of seeing these machines in action was not neglected.

Inevitable too was the interest in other forms of mechanisation and many questions were asked about the performances of the Conventry Climax (**Coventry Climax Engines Ltd., Fork Lift Division, Coventry**) and the Conveyancer (**Fork Trucks Ltd., Warrington**).

Similarly, the fork lift attachment at the rear of Ferguson Tractors (**Hoggarth's, Preston**) also impressed those who weighed up the pros and cons of the need for such a lift coupled with the tractor itself.

Quite a new departure in the field of sterilization was the calor gas outfit (**Maywick Appliances Ltd., Wickford**) the more so in view of the " Brown Disease " question and the need for increased farm hygiene whilst impressive too was a new type of power truck (**Whades-Sussex Ltd., Littlehampton**) a veritable maid of all work with its numerous extras including a trailer.

TO MALTA

Messrs. A. G. Linfield Ltd., of Thakeham, are now exporting fresh mushrooms to Malta. The mushrooms travel by air, leaving London Airport at midnight and are in Malta by 9 a.m. next morning. Mr. T. L. Robertson, Sales Manager to Messrs. Linfields said, " I understand they are arriving in perfect condition and meeting a ready sale. Although quantities are not large and we load only once a week, it is expected that the business will increase rapidly."

LAST MONTH'S PUBLICITY CONTRIBUTIONS

Among last month's publicity contributions which the Publicity sub-committee are happy to acknowledge are two from basket merchants —the first contributions to this fund to be received from this important section of the industry.

	£	s.	d.
Salesmen:—			
*C. Snowdon & Co. Ltd., Castlefold Market, Sheffield	2	15	5
*Jackson & Lakin Ltd., Nottingham	4	9	0
Spawn Merchants:—			
*†Monlough Food Production Co. Ltd., Ballygowan, Belfast.			
Basket Merchants:—			
F. Gough & Son Ltd., Fishergate, Norwich	10	10	0
Arthur Coomer Ltd., Ferlington, Portsmouth	5	5	0

*previous contributions already acknowledged

*†contributions by Spawn Merchants are not for publication

CHEQUES ACT, 1957

From now on the MGA will not issue official receipts for monies paid by cheque other than (*a*) in special circumstances and (*b*) unless requested to do so. The MGA will not require receipts for payments made by cheque on behalf of the Association.

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A very effective sterilizer with excellent penetrating powers. It controls fungus diseases and harmful bacteria.

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